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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/941,557

08/30/2001

R. J. Baker

M4065.0474/P474

6108

24998 7590 06/25/2009

DICKSTEIN SHAPIRO LLP  
1825 EYE STREET NW  
Washington, DC 20006-5403

EXAMINER

TRAN, DZUNG D

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

06/25/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

09/941,557

**Applicant(s)**

BAKER ET AL.

**Examiner**

Dzung D. Tran

**Art Unit**

2613

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9, 15-25, 28, 33-36, 38, 40, 101-108, 111-113, 115, 118-120, 122, 151-162 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

Continuation of Disposition of Claims: Claims pending in the application are 1-3,9,15-25,28,33-36,38,40,101-108,111-113,115,118-120,122 and 151-162.

## **DETAILED ACTION**

### ***Specification***

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 28, 35, 101-104, 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozeki et al. US patent no. 6,651,139 in view of Tajima US patent no. 5,367,397.

Regarding claim 1 Ozeki discloses in figure 6 a communication bus system between processors and memory modules comprising:

- a memory controller 11 (i.e. Processor 11a, 11b, 11c...);
- a bi-directional optical link 13 for transmit data to and from memory controller 11;
- at least one memory storage device 15 (i.e., cache memory) each at least one memory storage device 15 comprising a memory side electro-optical converter (i.e., interface 12) coupled to the bi-directional optical link;
- a controller side electro-optical converter (i.e., interface 12) for converting communication between the memory controller 11 and the bi-directional optical link.

Ozeki does not specifically disclose a wavelength detector for detecting a wavelength of optical signals sent from the controller side electro-optical converter and supplying the wavelength to the memory controller and a wavelength adjuster for adjusting the wavelength based upon the wavelength.

Tajima discloses in Figure 2, a wavelength control circuit 18 for detecting a wavelength of optical signals and for adjusting the wavelength based upon the wavelength (see abstract).

At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to include the wavelength control circuit taught by Tajima in the system of Ozeki. One of ordinary skill in the art would have been motivated to do in order to detect and adjust the optical wavelength of the optical signal. Thus, it improves the transmission signal at the transmitting terminal.

Regarding claim 2, Ozeki discloses memory controller 11 transmits data to said at least one memory storage device 16 through said optical path 13 (col. 5, lines 1-20).

Regarding claim 3, Ozeki discloses memory controller 11 and said at least one data includes at least one of memory device 16 are arranged and configured to exchange read/write data (col. 5, lines 42-65).

Regarding claims 101, Ozeki disclose in Figure 3, an electro-optical converter 21 comprising:

at least one input (i.e., electrical input) arranged and configured to receive an electrical data signal from a memory controller 11;

at least one optical output (i.e., to light signal) arranged and configured to transmit said optical signal into optical path 13.

Regarding claim 102, Ozeki discloses controller receives data from said at least one memory storage device through said optical path 13 (col. 5, lines 1-20).

Regarding claim 103, Ozeki discloses data includes at least one of read and write data (col. 5, lines 42-65).

Regarding claim 104, Ozeki discloses data includes address data transmitted from said controller to said at least one memory device (col. 8, lines 16-20).

Regarding claim 35, Ozeki discloses single optical path 13 further arranged and configured to exchange data includes address data transmitted from said controller to said at least one memory device (col. 5, lines 1-20).

3. Claims 24-25, 33-34, 36, 38, 40, 106-107, 115, 118-119, 122, 151 and 159 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozeki et al. US patent no. 6,651,139 in view of Tajima US patent no. 5,367,397 and further in view of Acton et al. US patent no. 5,544,319.

Regarding claim 105, as per claims above, the combination of Ozeki and Tajima discloses all the limitations except for data includes command data transmitted from said controller to said at least one memory storage device. Acton, from the same field of endeavor, discloses data includes command data transmitted from said controller to said at least one memory storage device (col. 16, lines 20-22).

At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to include the teaching of Acton in the system of Ozeki and Tajima. One of ordinary skill in the art would have been motivated to do in order to control the information between the memory controller and the memory storage device.

Regarding claim 106, Acton discloses data includes a clock signal (col. 9, lines 50- 51).

Regarding claim 107, Acton discloses data includes control data (figure 4, col. 6, line 24).

Regarding claim 24, Acton discloses at least one memory device is located memory coupled system (e.g. same as a memory module) (col. 2, lines 44-48).

Regarding claims 25, 115, Acton discloses the bus 5 of each memory coupled system is connected to an optical fiber 4 to memory coupling system controller (col. 2, lines 48-50).

Regarding claims 34, 119, Acton discloses single optical path 4 further arranged and configured to exchange data includes command data transmitted from said controller to said at least one memory device (col. 16, lines 20-22).

Regarding claim 36, Acton discloses single optical path 4 further arranged and configured to exchange data includes a clock signal (col. 9, lines 50- 51).

Regarding claims 33, 118, Acton discloses in figures 2 and 3, data includes read/write data which originates on a plurality of electrical paths, said optical path 4 comprising a plurality of discrete optical guides respectively associated with said electrical path (col. 3, lines 22-30).

Regarding claim 38, Acton discloses data includes control data (figure 4, col. 6, line 24).

Regarding claims 40, 122, Acton discloses in figure 1, a processor (col. 2, line 47) for communicating with said at least one memory device, wherein said controller 1, at least one memory device, processor, and optical path are all integrated on the same die (figure 1).

Regarding claims 151 and 159, multiplexed optical channels use TDM is well known in the art (for example SONET system).

4. Claims 9, 15-23, 108, 111-113, 152-154 and 160-163 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozeki et al. US patent no. 6,651,139 in view of Tajima US patent no. 5,367,397 and Acton et al. US patent no. 5,544,319 and further in view of Fee US Patent no. 6,658,210.

Regarding claims 9, 108, and 163, as per claims above, the combination of Ozeki, Acton and Tajima discloses all the limitations except for optical path comprises a plurality of multiplexed optical channels, said data being transmitted over said multiplexed optical channels. Fee discloses a WDM optical system comprising a bi-directional optical fiber has a plurality wavelengths to carry information (abstract) and data being transmitted over multiplexed optical channels (e.g. WDM, see col. 2, lines 47-55).

At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporated WDM coupler for multiplexing and de-multiplexing



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optical signals of Fee in the combination of Ozeki, Acton and Tajima. One of ordinary skill in the art would have been motivated to do this since Wavelength Division Multiplexing Multiplex/Demultiplex coupler offers advantages of allowing the optical signals transmits back and forth over an bi-directional optical link and allow multi-wavelengths to communicate via single fiber or wave guide.

Regarding claims 59, 111, 112, the combination of Ozeki, Acton, Tajima and Fee discloses a multiplexer/demultiplexe (220 of figure 3 of Fee) associated with said controller for multiplexing said optical channels, and associated with said at least one memory device for demultiplexing said multiplexed optical channels.

Regarding claim 16, the combination of Ozeki, Acton, Tajima and Fee discloses a multiplexer/demultiplexe (226 of figure 3 of Fee) associated with said at least one memory device for multiplexing optical channels and providing multiplexed optical channels to said optical path 4 and associated with said memory controller for demultiplexing said multiplexed optical channels.

Regarding claims 17, 113, the combination of Ozeki, Acton, Tajima and Fee discloses a multiplexer/demultiplexe (220, 226 of figure 3 of Fee) located on each side of said optical path.

Regarding claim 18, Acton discloses data includes at least one of read and write data (abstract, col. 2, lines 48-51).

Regarding claim 19, Acton discloses data includes command data transmitted from said controller to said at least one memory device (col. 16, lines 20-22).

Regarding claim 20, Acton discloses data includes address data transmitted from said controller to said at least one memory device (figure 3, col. 3, line 49, col. 5, lines 54-62).

Regarding claim 21, Acton discloses data includes a clock signal (col. 9, lines 50-51).

Regarding claim 22, Acton discloses data includes control data (figure 4, col. 6, line 24).

Regarding claim 23, Acton discloses electrical paths connected between said controller 1 and said at least one memory device 5 for passing data between said controller and memory device (see figure 3).

Regarding claims 152-153, 160 and 161, Fee discloses multiplexed optical channels use WDM (see col. 2, lines 47-55).

Regarding claims 154 and 162, transmitting compressed data is well known in the art.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-3, 9, 15-25, 28, 33-36, 38, 40, 101-108, 111-113, 115, 118-120, 122, 151-162 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung Tran whose telephone number is (571) 272-3025.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Vanderpuye Kenneth, can be reached on (571) 272-3078.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Dzung Tran

06/21/2009

/Dzung D Tran/

Primary Examiner, Art Unit 2613